
A History of Corporate Finance

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Contents

<i>Preface</i>	ix
Introduction: History and the Modern Theory of Finance	1
Part I The Preindustrial World	
1 Medieval and Renaissance Origins	29
2 Corporate Finance in the Age of Global Exploration: Trading Companies and Oceanic Discovery, 1450–1720	55
3 The Emergence of Public Markets for Investment Securities, 1688–1815	89
Part II The Rise of Modern Industry	
4 Finance in the Age of Canals and Railroads, 1775–1900	127
5 Common Stock Finance and the Rise of Managerial Capitalism, 1900–1940	167
Part III The Transition to the Contemporary Era	
6 The Financing of Center Firms, 1940–1973	213
7 Conglomerates and Leveraged-Buyout Partnerships	258
Epilogue	303

CONTENTS

APPENDIX A: Finance and Informational Asymmetries in the Ancient World	313
APPENDIX B: International Patterns of Corporate Governance	322
<i>Index</i>	331

Introduction

History and the Modern Theory of Finance

I. The Two Lenses of Economic Theory

History and statistics have long been thought of as vital adjuncts in scholarly efforts to further the understanding of economics and allied fields such as corporate finance. In his classic work, *The Scope and Method of Political Economy* (1890), John Neville Keynes, for example, characterized the nature of the relationship between these two specializations as essentially complementary.¹ Inherent in this view was the belief that economic understanding could be brought into sharpest focus only by blending the unique perspectives afforded by each discipline, like the images cast by the separate lenses of a stereoscope.

Although in general accord with Keynes about the relevance of these two types of knowledge, Joseph A. Schumpeter later expressed, in his *History of Economic Analysis* (1954), the controversial opinion that historical studies were the more important. In his view economics was a uniquely historical process whose significance could be fully grasped only when viewed in a broader social context which incorporated events, institutions, individuals and organizations. In contrasting history with statistics and theory as a focus of scholarly endeavor, he wrote:

Of these fundamental fields, economic history – which issues into and includes present day facts – is by far the most important. I wish to state right now that if, starting my work in economics afresh, I were told that I could study only one of the three but could have my choice, it would be economic history that I would choose. And this is on three grounds.

¹ John Neville Keynes, *The Scope and Method of Political Economy* (London: Macmillan, 1890).

First, the subject matter of history is essentially a unique process in historic time. Nobody can hope to understand the economic phenomena of any, including the present, epoch, who has not an adequate command of historical *facts* and an adequate amount of historical *sense* or of what might be described as *historical experience*. Second, the historical report cannot be purely economic but must inevitably reflect also “institutional” facts that are not purely economic: therefore it affords the best method for understanding how economic and non-economic facts *are* related to one another and how the various social sciences *should* be related to one another. Third, it is, I believe, the fact that most of the fundamental errors currently committed in economic analysis are due to lack of historical experience more often than to any other shortcoming of the economist’s equipment. History must of course be understood to include fields that have acquired different names as a consequence of specialization, such as prehistoric events and ethnology (anthropology).²

This study follows Schumpeter by employing historical methods to amplify an important contemporary paradigm, the “modern theory of finance,” which evaluates two central questions: the first is the *financing question*, which identifies the determinants of optimal capital structure decisions; and the second is the *dividend question*, which explains the factors that control decisions about the distribution of residual income to shareholders.³

Although this study emphasizes the influence of changing institutional relationships, it recognizes the strong contribution of quantitative and statistical research in elevating the comprehension of finance. Since World War II, horizons of knowledge have been broadened by scholars who sought to place economics on a “positive” basis more akin to the physical sciences.⁴ The intellectual constructs they set forth

² Joseph A. Schumpeter, *History of Economic Analysis*, Elizabeth Boody Schumpeter, ed. (New York: Oxford University Press, 1954), pp. 12–13.

³ A third question that is not directly addressed by the modern theory of finance is concerned with how scarce financial resources are allocated between competing investment alternatives. For a discussion of the relationship of these fundamental questions, see James C. Van Horne, *Financial Policy and Management*, 10th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1994), chapt. 1 *passim*.

⁴ During this era several proponents of these views wrote influential works about how economics might be placed on a more positive basis, including Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chi-

were built up from a priori assumptions and were formalized and tested empirically. The importance of the insights rendered by the new scientism was evinced by the fact that four of its pioneers were awarded Nobel Prizes for economics during the 1980s. Their studies incorporated a distinctive methodological approach. They evaluated general problems by deductively specifying assumptions based on delineations of rational behavior that communicated the essential significance of the model. Although the model in its simplest form does not claim to reflect external conditions precisely, its consistency, completeness and implications can be evaluated through formal logic and mathematics. Its underlying suppositions, however, are expressed as rules that state how the model's elements correspond to circumstances in the real world.

This brings us to another purpose of this book, which is to demonstrate the need for greater recognition of path dependence and historical evolution in the modern theory of finance.⁵ This does not mean that the modern theory is internally inconsistent or that practitioners, as distinct from theoreticians, do not amend the basic model according to the needs of their inquiries. It does mean that, as in all scientific research, there is a very real danger that the regnant model biases the approach of analysts and restricts the degree to which they are willing to incorporate or recognize relevant variables.⁶

Chicago Press, 1953); Andreas G. Papandreou, *Economics as a Science* (Chicago: Lippincott, 1958); and Lionel Robbins, *An Essay on the Nature and Significance of Economic Science* (London: Macmillan, 1932).

⁵ A similar argument about the need for history to be incorporated into economic theory building has been made by Daniel M. G. Raff and Peter Temin, "Business History and Recent Economic Theory: Imperfect Information, Incentives and the Internal Organization of Firms," in Peter Temin, ed., *Inside the Business Enterprise: Historical Perspectives on the Use of Information* (Chicago: University of Chicago Press, 1991), pp. 7-35.

⁶ For a discussion of some of the implications for research of a narrow concentration on positive economics, see Phyllis Deane, "The Scope and Method of Economic Science," *Economic Journal* 93 (March 1983): 1-12; H. Peter Gray, "Social Science or Quasi Science," *Eastern Economic Journal* 15 (October-December 1989): 273-86; and E. H. Phelps-Brown, "The Underdevelopment of Economics," *Economic Journal* 82 (March 1972): 1-10. See also the discussion of the consequences of scientism in management studies in Milton Leontiades, *Mythmanagement: An Examination of Corporate Diversification as Fact and Theory* (Oxford: Blackwell, 1989), chapt. 1 passim.

What role, then, is played by institutions and organizations in corporate finance? Following Lance E. Davis and Douglass C. North, institutions represent constraints that shape social interaction. In business and finance they are, in effect, the rules of the game for pursuing opportunity and thus define the range of possibilities open to entrepreneurship. Their value lies largely in their capacity to reduce uncertainty and to foster economic stability. They can be either formal, as in the case of contemporary long-term debt contracts, or informal, as in the case of the norms of probative behavior that guided traders in early financial markets.⁷

Organizations, which are groups unified to pursue a common objective, operate within social settings that are ordered by institutional constructs. Historically, organizations such as corporations, joint-stock companies and partnerships have been the primary social vehicles for exploiting economic opportunity. Institutions provided the cohesion for organizations to bind together their component elements and to define their relationships to the external environment. Moreover, institutions were crucial to organizations because they often embodied information that had been distilled from past experience about what are thought to be the “best” ways to achieve particular objectives. Among the leading business organizations that are the focus of this study, such institutional development came about through a path-dependent process of firm-specific learning about the most efficacious ways of accommodating a dynamic economic environment.⁸

In addition to questions of capital structure and dividend payment, this study’s focus on institutional and organizational change makes it possible to analyze the ways that financial innovation historically contributed to the achievement of substantial efficiency gains. The sample of firms selected for evaluation is heavily biased in favor of those that proved highly adept during each epoch in securing a strong

⁷ For a discussion of the role of institutions in economic history, see Lance E. Davis and Douglass C. North, *Institutional Change and American Economic Growth* (Cambridge University Press, 1971), pp. 6–10; Douglass C. North, *Institutions, Institutional Change and Economic Performance*, reprint ed. (Cambridge University Press, 1991), pp. 3–5; and idem, “Economic Performance through Time,” *American Economic Review* 84 (June 1994): 359–68.

⁸ North, *Institutions, Institutional Change and Economic Performance*, pp. 5–6; and Davis and North, *Institutional Change and American Economic Growth*, pp. 7–8.

position of economic leadership because of their ability to concentrate large amounts of financial capital. Thus, some of the chapters focus on assessing the contributions of great individual ventures such as the Medici Bank and the English East India Company. The remaining chapters, on the other hand, analyze the experience of important classes of business organizations such as railroads in the nineteenth century and giant, diversified manufacturing companies during the twentieth century.

Four sets of circumstances were preeminent in the drive of the firms evaluated in this study to bolster efficiency through financial innovation. First, there was the potential for realizing significant economies of scale and scope, a potential that was often contingent on a firm's capacity to devise effective ways of attracting substantial amounts of financial capital. In these cases finance was usually an ancillary activity that was vital for the acquisition of managerial and productive resources necessary to exploit untapped opportunities. By providing for the orderly disposition of liabilities, finance ensured that there was sufficient time available for the enterprise to learn how to incorporate new, efficiency-enhancing technologies and forms of management.⁹

Second, financial innovation could help corporate entities capture gains from exogenous events. For example, the rearrangement of financial commitments could facilitate the adjustment to major economic disturbances in the form of either sectoral shocks such as serious turbulence in the financial market or macro shocks such as significant changes in relative price or income levels. Moreover, modifications of financing practices could make possible the realization of gains from changes in tax or regulatory policies, political events such as wars or major environmental changes such as weather shifts that affected communications and agricultural output.¹⁰

⁹ Davis and North, *Institutional Change and American Economic Growth*, pp. 12–14. For a discussion of how modern business organizations promote economies of scale and scope, see Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass.: Harvard University Press, 1977); idem, *Strategy and Structure: Chapters in the History of the Industrial Enterprise* (Cambridge, Mass.: MIT Press, 1962); and idem, *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass.: Harvard University Press, 1990).

¹⁰ Davis and North, *Institutional Change and American Economic Growth*, pp. 14–19.

Third, gains could derive from financial innovations that reduced risk perceptions. A key problem was the asymmetric distribution of information about the enterprise and its prospects that separated managements from investors. Differences in goals and in access to knowledge frequently placed investors at a disadvantage in dealing with their corporate agents. Investor wealth, for example, could be threatened either by corporate agents' opportunism or, in the extreme case of moral hazard, by their dishonesty. Such risks could be diminished by more effective contracting: the securing of liens on enterprise assets could protect investors against default risk, and the goals of management could be made more congruent with those of shareholders in the negotiation of incentive compensation contracts. In addition, risk perceptions could be dissipated by more effective monitoring through the creation of boards of directors and the establishment of financial reporting requirements.¹¹

Fourth, financial innovations could be effective in surmounting costly market imperfections.¹² Gains could result from the creation within the firm of information flows and managerial structures that reduced transaction costs below the level that would have been incurred by relying on market structures. In finance, as in other functional specializations, there were three levels of organizational development that gradually emerged from a path-dependent process of corporate learning.¹³ The first involved the establishment of basic routines to ensure the efficient processing of recurring transactions such as procedures for controlling cash receipts from sales transactions. The second level was the development of methods for integrating and coordinating the financial requirements of major functional activities such as sales and manufacturing. The highest level was strategic planning, which was concerned with determining how the pool of enterprise resources might be optimally allocated to take advantage of anticipated changes in the environment of business.

Although costly, the creation of structures that increased the velocity and scope of knowledge transfers within the firm provided additional financial benefits. Accessibility to a greater abundance of reli-

¹¹ Ibid., pp. 19–20. ¹² Ibid., pp. 20–25.

¹³ Alfred D. Chandler, "Organizational Capabilities and the Economic History of the Industrial Enterprise," *Journal of Economic Perspectives* 6 (Summer 1992): 79–100.

able information helped to reduce the costs of adverse selection and of insurance through more accurate assessments of risk. It also increased the potential returns from financial transacting by expanding the awareness of the range of exploitable market opportunities.

The remainder of this chapter provides background about some of the controversies surrounding the modern theory of finance. We begin by considering the factors that have contributed to the reinvigoration of positive economics since World War II. This is followed by four sections that highlight key issues in the scholarly debate over the findings of the modern theory of finance: the intellectual foundations of the modern theory, the findings of this theory with respect to debt policy, the role that dividend payments are purported to play in corporate financing and the problem of agency and information-related market inefficiencies. The chapter concludes with a brief overview of the organization of the subsequent sections of the book.

II. Sharpening the Focus of the Quantitative Lens

Before World War II several developments encouraged the greater quantification of economics and finance. Many scholars wanted to place these subjects on a more scientific plane by embracing the analytical approaches espoused by leading philosophers of science. This goal seemed plausible because of the greater computational efficiency made possible by advances in both statistics and data processing and because of the definition of new behavioral models that applied mathematical and logical processes in analyzing business decision making.

During the 1930s and 1940s many economists were favorably impressed by the ideas put forth by philosopher Karl R. Popper about what constituted the most valid approaches in scientific inquiry. Central to Popper's perspective was a deep misgiving about the reliability of knowledge derived from inductive reasoning, which he thought was incapable of verifying general scientific laws. The shortcomings of induction seemed most evident in the social sciences – for example, in the claims of Marxists that history, a subject whose comprehension was essentially extended through inductive studies, followed immutable laws. Popper considered this conclusion to be dubious for two reasons. First, the finite scope of human comprehension created uncertainty about generalizations developed by extrapolating from particu-

lar cases. In addition, induction was logically flawed because it violated the syllogistic prohibition against confirming consequent statements. Although he believed that empirical knowledge was incapable of verifying universal laws, Popper nevertheless thought that it was useful in identifying statements that were materially false. In his view the body of scientific knowledge at any point in time consisted of those statements that had successfully resisted rigorous tests of “falsifiability.” In this schema, progress came about only through a continual process of conjecture, criticism and reformulation.¹⁴

After World War II this began to have greater appeal to many intellectuals, who were as impressed by the solid achievements of modern science as they were dismayed by the dim record of contemporary politics. The wars, depressions and cataclysms of this period doubtless seemed reflective of a fundamental failure to establish the social sciences on a firm intellectual footing. Milton Friedman, for example (who was favorably impressed by Popper’s ideas), argued that more positive economics would ultimately promote greater social harmony, namely:

I venture the judgement, however, that certainly in the Western world, and especially in the United States, differences about economic policy among disinterested citizens derive predominantly from different predictions about the economic consequences of taking action – differences that in principle can be eliminated by the progress of positive economics – rather than from fundamental differences in basic values, differences about which men can ultimately only fight.¹⁵

The changing tenor of finance scholarship was also reflected in the formation in 1932 of the Cowles Commission, a pioneering organization based initially in Colorado Spring, Colorado, that was dedicated

¹⁴ See Karl R. Popper, *The Poverty of Historicism* (Boston: Beacon, 1957); and idem, *Objective Knowledge: An Evolutionary Approach* (Oxford: Clarendon Press, 1972). For a discussion of Popper’s impact on post-World War II research methodologies in economics, see Mark Blaug, *The Methodology of Economics, or, How Economists Explain*, 2nd ed. (Cambridge University Press, 1992); and idem, *Economic Theory in Retrospect*, 4th ed. (Cambridge University Press, 1985), chapt. 16. For a more general evaluation of Popper’s theoretical thinking, see Robert John Ackermann, *The Philosophy of Karl Popper* (Amherst: University of Massachusetts Press, 1976).

¹⁵ Friedman, *Essays in Positive Economics*, p. 5.

to the rigorous quantitative study of securities markets and price activity. Its founder, Arthur C. Cowles III, was the scion of a wealthy Chicago family who had become interested in determining whether price fluctuations were predictable as part of his estate management responsibilities.¹⁶ Although econometric techniques had been already applied in the 1920s by scholars like Wesley C. Mitchell at Columbia University and Warren M. Persons at Harvard University, little emphasis had been placed on explaining security price fluctuations.¹⁷ Moreover, one prescient statistical study of financial markets, prepared in 1900 by French mathematician Louis Bachelier and entitled *Theory of Speculation*, had remained largely forgotten for decades. Instead, the analysis of price movements had remained the province of financial journalists such as Charles Dow, the founder and editor of the *Wall Street Journal*, and his successor as editor, William Peter Hamilton, who popularized a method of stock price charting known as "Dow Theory." With the creation of the Cowles Commission, however, the opportunity for a more scientific study of price data greatly increased. The influence of the Commission's program on financial scholarship was soon reflected in its closer association with mainstream academic economics. In 1933, the Commission began to finance *Econometrica* (whose first editor was Joseph Schumpeter). In 1939 the Commission further cemented these relationships by moving initially to the University of Chicago and then in the 1950s, when it came under the direction of future Nobel laureate James Tobin, to Yale University, Arthur Cowles's alma mater.¹⁸

The quantification of economics and finance was also an outgrowth of developments that enhanced computational effectiveness and efficiency. During the 1930s, new statistical techniques perfected by R. A. Fischer, Jerzy Neyman and Egon Pearson for biological research eventually found outlets in analyzing economic aggregates. Success in resolving problems in cryptography, logistics, fire control and pattern

¹⁶ Peter L. Bernstein, *Capital Ideas: The Improbable Origins of Modern Wall Street* (New York: Free Press, 1992), pp. 29–38.

¹⁷ Guy Alchon, *The Invisible Hand of Planning: Capitalism, Social Science and the State in the 1920s* (Princeton, N.J.: Princeton University Press, 1985), especially chapt. 6; and Mary S. Morgan, *The History of Econometric Ideas* (Cambridge University Press, 1990), pp. 44–56 for discussion of Mitchell, and pp. 56–63 for Persons.

¹⁸ Bernstein, *Capital Ideas*, pp. 17–29, 33, 37 and 67.

bombing during World War II augmented the prestige of statistics and operations research. The potential for more fruitful mathematical analysis was enhanced by the perfection of electronic data processing. The miniaturization of circuitry made possible by the invention of the transistor led to dramatic declines in the costs of analyzing vast amounts of information. Moreover, the quality and quantity of corporate financial data steadily improved through the further standardization of financial accounting. Finally, the rise of cybernetics and game theory assisted this transition by providing a logical framework for formulating testable hypotheses about business decision processes.¹⁹

During the 1950s many business disciplines sought to enhance their prestige by embracing the quantitative methodologies in vogue in the better-established programs in economics. Business education, since its inception near the turn of the current century, had remained isolated from many of the beneficial trends that had enriched other fields of scholarship. The body of knowledge in finance, for instance, had been largely descriptive, focusing on institutional and legal structures, modes of long-term corporate finance and pragmatic guidelines for investment analysis. The research literature remained sparse on such questions as the management of risk or working capital and the operation of the capital markets. Nor were there any attempts to unify these fragments through a comprehensive theoretical synthesis.²⁰

The new trends in research and instruction were further advanced by the separate studies coming from the Ford Foundation and Carnegie Foundation calling for greater intellectual rigor in business studies.²¹ There soon followed a major reorientation. In finance the subsequent reform was directed largely by economists who naturally followed the accepted pathways of their specialization. Finance be-

¹⁹ John Von Neumann, *The Computer and the Brain* (New Haven, Conn.: Yale University Press, 1958); and Von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior*, 3rd ed. (Princeton, N.J.: Princeton University Press, 1944, 1953).

²⁰ For a discussion of some of the factors changing the nature of education in finance, see R. Whitley, "The Transformation of Business Finance into Financial Economics: The Roles of Academic Expansion and Changes in U.S. Capital Markets," *Accounting, Organization and Society* 11 (1986): 171-92.

²¹ See Robert A. Gordon and James E. Howell, *Higher Education for Business* (New York: Columbia University Press, 1959); and Frank Cook Pierson, *The Education of American Businessmen* (New York: McGraw-Hill, 1959).

came more intimately intertwined with neoclassical economic theory. Capital markets were analyzed in the context of equilibrium models of perfect product market competition. Market valuation processes provided the rationale for evaluating corporate finance decisions. This transformation was reflected in the growing number of quantitative studies that began to appear in what was finance's traditional leading periodical, the *Journal of Finance*. This trend was furthered in two later, highly regarded publications, the *Journal of Finance and Quantitative Analysis* (1966) and the *Journal of Financial Economics* (1974).

The application of the logical and mathematical methods that formed the core of the new approach to comprehending finance was not limited to the evaluation of the aggregative behavior of markets. As the following sections explain, these approaches also proved useful in theorizing about how business corporations financed their activities.

III. Foundations of the Modern Theory of Finance

The original research that eventually led to the promulgation of the modern theory of finance focused on two fundamental issues: (1) the predictability of stock price movements and (2) the minimization of portfolio risk. In 1953, M. G. Kendall published a study demonstrating that successive prices in both the stock and the commodity markets moved in random fashion. The failure to discover any systematic correlation in price movements over time was explained as evidence of the inherent efficiency and competitive nature of the financial markets. In this context efficiency specifically related to the capacity of the market to discount all relevant and known information about future dividends or capital values. Future price changes must necessarily reflect new and therefore unpredictable information. It is this uncertainty about future conditions that in turn dictates that share prices fluctuate in random fashion.²²

The efficient market hypothesis, however, left unresolved several important questions. It did not, for example, define specifically what constitutes information relevant to evaluating share prices. Nor did it indicate the effect of variation in the quantity and quality of informa-

²² Maurice Kendall, "The Analysis of Economic Time Series, Part I: Prices," *Journal of the Royal Statistical Society* 96 (1953): 11–25.

tion available to investors. The hypothesis also failed to establish a standard for assessing informational veracity or to discuss the implications of valuations based on inaccurate data. Moreover, it did not explain how information was used in decision making.

Soon Harry Markowitz addressed these problems as part of his work in portfolio theory. In his model the essential trade-off confronting investors was between risk and return. In this context rational behavior was associated with the desire to maximize return and minimize risk. The riskiness of investing in particular securities could be reduced by holding significantly diversified portfolios. Although diversification could not eliminate the risk associated with overall market fluctuations, portfolio managers could still choose portfolios that either accentuated or dampened the amplitude of these movements. The covariance of a particular company's shares to the overall market, or "beta," was the critical sensitivity measure for portfolio managers.²³

During the next two decades, four scholars extended Kendall's and Markowitz's insights, thereby laying down the basic foundations of the modern theory of finance. First in 1958, Franco Modigliani and Merton H. Miller published their seminal paper on optimal capital structures in an economy that had perfect markets and was not burdened with either taxes or transaction costs.²⁴ This was soon followed in 1965 by John Lintner's extension of Markowitz's portfolio model.²⁵ Assuming perfect markets incorporating homogeneous beliefs and unlimited costless short-sales, Lintner derived his version of the capital asset pricing model (CAPM), which predicted a linear equilibrium relationship between risk and return. By 1970, the market rationality assumption inherent in these models seemed well founded when Eugene Fama confidently concluded that "the evidence in support of the efficient market hypothesis is extensive, and . . . contradictory evi-

²³ Harry Markowitz, "Portfolio Selection," *Journal of Finance* 7 (March 1952): 77-91.

²⁴ Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review* 48 (June 1958): 261-97.

²⁵ John Lintner, "Security Prices, Risk, and Maximal Gains from Diversification," *Journal of Finance* 20 (1965): 587-615; and idem, "The Valuation of Risky Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets," *Review of Economics and Statistics* 47 (1965): 13-37.

dence is sparse.”²⁶ In this view, capital markets are perfect and frictionless, and price securities at the best estimate of their intrinsic value. Moreover, this view implies yet another assumption about human behavior. It follows from the efficient market hypothesis that corporations act in the interests of their securities holders and, therefore, are primarily committed to maximizing the value of their securities.

But the assumption that firms are seeking to maximize shareholder wealth seems unpersuasive and is at variance with the broad body of research in finance and other social sciences. An extensive literature on the development of professions, for example, emphasizes the lack of congruence in the objectives of practitioners and consumers for many types of specialized services. Nor do the findings of many historians suggest that politicians run governments solely for the benefit of the electorate. Beginning with Adam Smith, many economists have been sensitive to the inherent conflicts between the interests of owners and managers.²⁷ Adolf A. Berle and Gardiner C. Means in their classic *The Modern Corporation and Private Property* (1932) identified this dichotomy as a critical issue for those charged with the responsibility of reforming the financial markets.²⁸ Herbert A. Simon later embellished this notion by suggesting that management’s actions were constrained by bounded rationality and could be better characterized as “satisficing” rather than optimizing.²⁹ These perceptions eventually influenced finance literature. In 1972, Armen A. Alchian and Harold Demsetz authored their seminal paper that sparked a new interest in studying the pervasive, but poorly understood problems of agency relations.³⁰

The empirical evidence also calls into question the validity of the

²⁶ Eugene F. Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work,” *Journal of Finance* 25 (1970): 383–417.

²⁷ Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, 2 vols., reprint ed. (Chicago: University of Chicago Press, 1976), vol. 2, pp. 264–65.

²⁸ Adolf A. Berle and Gardiner C. Means, *The Modern Corporation and Private Property* (New York: Commerce Clearing House, 1932).

²⁹ Herbert A. Simon, *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization*, 2nd ed. (New York: Macmillan, 1957), chapt. 2 and pp. 241–42.

³⁰ Armen A. Alchian and Harold Demsetz, “Production, Information Costs and Economic Organization,” *American Economic Review* 62 (1972): 777–

modern theory's efficiency assumption. While contemporary financial markets may be more functional than those of the past, even the most recent studies suggest major inefficiencies. Schiller, for instance, shows that stock prices appear too volatile to be consistent with rational valuation. He points out that U.S. stock prices during the period 1871–1979, varied five to thirteen times as much as would be rationally expected given the actual observed volatility in the dividend stream.³¹ Schiller also confirms this in a second study, which evaluates long-term interest rate patterns. He concluded that long rates seemed more volatile than would be predicted from either observed short-term interest rates or the term structure theory.³²

Recent evidence also suggests that price variation is not absolutely random. For example, large predictable (and occasionally exploitable) cycles in financial markets are now an established fact. Furthermore, tests that show that simple strategies do not always provide supranor-

95. See also the later studies of William H. Meckling and Michael C. Jensen, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3 (1976): 305–70; Eugene F. Fama, "Agency Problems and the Theory of the Firm," *Journal of Political Economy* 88 (1980): 288–307; Eugene F. Fama and Michael C. Jensen, "Agency Problems and Residual Claims," *Journal of Law and Economics* 26 (1983): 327–49; and idem, "Separation of Ownership and Control," in *ibid.*, pp. 301–25.

³¹ Robert J. Schiller, "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" *American Economic Review* 71 (June 1981): 421–36.

³² Robert J. Schiller, "Causes of Changing Financial Market Stability," *Symposium on Financial Market Volatility – Causes, Consequences and Responses Sponsored by the Kansas City Federal Reserve Bank* (Jackson Hole, Wyo.: 1988). A number of other studies confirm Schiller's findings, including N. Gregory Mankiw, David Romer and Mathew D. Shapiro, "An Unbiased Reexamination of Stock Market Volatility," *Journal of Finance* 40 (July 1985): 677–87; and Andrew W. Lo and A. Craig MacKinlay, "Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test," *Review of Financial Studies* 1 (1988–89): 41–66. Moreover, James M. Poterba and Lawrence H. Summers, "Mean Reversion in Stock Prices: Evidence and Implications," *Journal of Financial Market Economics* 22 (1988): 27–60, provide striking prices in seventeen countries. A contrary opinion, however, is held by Eugene F. Fama and Kenneth R. French, "Permanent and Temporary Components of Stock Prices," *Journal of Political Economy* 96 (1988): 246–73, who argue that mean risk aversion is the "rational" outcome of changing fickle tastes as risk aversion abruptly shifts in each period.